96M2781o

96M2791o

Single Board Computer

User's Guide

Chapter 1

Introduction

Welcome to the Dual Pentium III with socket 370 single board computer.

The SBC is a brand new generation of advanced technologies. It's built with high performance Dual Pentium III CPU running 133 MHz Front Size Bus, high performance 64bit/66 MHz PCI Bus, huge memory support (2 GB), and complies with the new PICMG standard. It's excellent to the system integrators, VARs, or turnkey vendor demanding high performance computing, high performance I/O, high data availability, and great system expandability. The SBC is a powerful engine best for the applications such as CTI servers, image animation, video on demand, and any specialized servers needing top computing power, top I/O bandwidth.

The SBC can run with Dual Intel Pentium III processor up to 1 GHz, memory support up to 2 GB RDRAM and the memory bus bandwidth could be 3.2 GB per second. This generates great computing power. The SBC also supports ECC not only at the main memory, the ECC capability also extends up to the L2 Cache in the Pentium III CPU, so the data integrity is further enhanced.

One extremely important feature of the SBC is its 64 bit/66 MHz PCI bus. The PCI bus could boost the PCI bandwidth up to 533 MB per second, quadrupling the traditional 32bit/33MHz PCI bus. This makes the SBC most balanced in computing power as well as I/O performance. The on board VGA is SMI721, which is 2XAGP based graphics/video accelerator with the on chip memory from 2 MB, 4 MB up to 16 MB (depending on models). The SBC could also be used as the powerful graphic/video platform. It also supports TFT panel

The on board enhanced PCI IDE interface can support up to mode 4 PIO and Mode 2 DMA master, and the new ATA66 transfer. The SMSC LPC47B272 integrates the floppy controller, two serial ports and one parallel port. The two on-chip UARTs are compatible with NS16C550, and the parallel port support EPP/ECP. The keyboard/mouse controller is also supported on chip.

The PICMG standard makes the SBC work with the legacy ISA back plane and brand new PCI/ISA back plane, and the ISA MAX feature is also built in for ISA add-ons up to 20 boards. The SSD solution, the socket for Disk On Chip of M-systems is reserved. It can support the DOC up to 144 MB.

The flash ROM is used to make the BIOS update easier, and the additional keyboard connector is reserved for connecting to the keyboard connector on the back plane. The brand new Universal Serial Bus (USB) is also supported by this product for more advanced applications. The high precision real time clock/calendar is built in for accurate scheduling and the watchdog timer is also the standard feature.

The SBC uses the latest generation Intel 840 chipset, which delivers the fastest speed in CPU, memory as well as the PCI bandwidth. Moreover, the major operating environments such as Windows NT 4.0, Windows 2000, SCO Open Server 5 and Novell Netware 4 can run with our SBC without any modifications. The emerging new Unix based operating systems like the Red Hat Linux, Free BSD, and the well-established SUN Solaris are also running well with the SBC.

1-1 Specifications

Specification

- **System Architecture**
  - Full size SBC with 64bit PCI/ISA Golden finger
  - Intel Socket 370 Pentium III with 100/133MHz FSB
  - PCI V2.2 complied
  - PICMG 1.0 (Rev.2.0) complied
  - Intel MPS1.1/1.4 specification complied
- **CPU Support**
  - Intel Pentium III CPU with 256K cache on die
  - Brand New Socket 370 FC-PGA CPU running at 100/133MHz FSB up to 1GHz
  - Dual CPU support
  - Support streaming SIMD instruction
- **Main Memory**
  - Support RDRAM up to 2GB (Max.)
  - 184 pin RIMM socket ×4
  - ECC support (single bit error correction/ multiple bit errors reporting)
- **BIOS**
  - Award System BIOS
  - Plug & Play support
  - Advanced Power Management support
  - Advanced Configuration & Power Interface support
  - 4M bits flash ROM
- **Chip Set**
  - Intel 840 Chipset support up to 2-way configurations
  - 64-bit and 66MHz PCI interface
  - 82840 ×1 Memory Controller Hub (MCH)
  - 82801 ×1 I/O Controller Hub (ICH)
  - 82802 ×1 Firmware Hub (FWH)
  - 82806 ×1 64 bit PCI Controller Hub (P64H)
  - ITE 8888F ×1 PCI to ISA Bridge

- **On Board VGA (96M2781o only)**
  - **C&T 69000/69030 VGA controller (PCI mode)**
  - TFT LCD/DSTN LCD/CRT control
  - **2/4MB SDRAM on die**
  - Maximum Res. Color & Refresh Rate

Resolution	Colors	Refresh Rate (Hz)
1280×1024	256	60
1024×768	16bits (High color)	85, 75, 65
800×600	24bits (True color)	85, 75, 65

  - Driver support：Windows 95/98, Windows NT4.0
  - 15 pin D-type connector ×1, 50 pin LCD panel connector ×1
- **On Board I/O**
  - SMSC LPC47B272 Enhanced Super I/O on board
  - SIO×2, with 2x16C550 UARTs, 10 pin header ×1, 9 pin D-type connector ×1, Optional RS422/485 ×1
  - PIO×1, bi-directional, EPP/ECP support, 26 pin connector ×1
  - Floppy Disk controller：5.25" 360KB/1.2MB, 3.5" 720KB/1.2MB/1.44MB/2.88MB support, 34 pin connector ×1
  - On chip enhanced IDE x 2, PIO up to mode 4, DMA master up to mode 2, Ultra DMA/66 support, 40 pin connector × 2, total 4 E.IDE devices support
  - On chip Keyboard, mouse controller, 5 pin connector x 1(for other keyboard)； 6 pin mini DIN connector ×1, for PS/2 keyboard/mouse
  - On board USB port ×2 (6pin header ×1)
  - On Board buzzer ×1
  - On board 2 pin header for I^2C
  - On board 4 pin header for IrDA
  - On Board 2 pin header for reset SW, 4 pin for speaker, 5 pin for keylock
- **On Board Solid State Disk Socket**
  - On board reserved socket for DOC of M-systems：2MB~288MB, etc
- **System Monitor**
  - Winbond W83782D system monitor controller
  - Seven voltage (For +3.3V, +5V, +12V, −12V, Vtt and Vcore ×2)
  - Two Fan speed (For CPU)
  - Three temperature
  - Drivers support：Windows 95/98, Windows NT4.0/2000

- **Bracket Connector**

MODEL / ITEM	96M2781o	96M2791o
PS/2 connector (for keyboard/mouse)	2	2
15 pin D-type connector (for VGA)	1	0
9 pin D-type connector (for serial port)	1	2

- **ISAMAX Support**
  - Maximize ISA signals to support ISA cards up to 20
- **Watchdog Timer**
  - 1,2,4…64 seconds time-out intervals
- **Dimensions**
  - 340mm(L) × 122mm(W)
- **Power Requirements**
  - +5V：20A(Max)
  - +12V：500mA(Max)
  - –12V：50mA(Max)
- **Environments**
  - Operating temperatures：0°C to 60°C
  - Storage temperatures：-20°C to 80°C
  - Relative humidity：10% to 90% (Non-condensing)
- **Certification**
  - CE approval
  - FCC Class A
- **Model Available**
  - 96M2781o -- Full-size Dual Socket 370 Pentium III CPU Card w/VGA/RDRAM
  - 96M2791o -- Full-size Dual Socket 370 Pentium III CPU Card w/RDRAM

1-2 What you'll have from the package

In addition to this manual, the SBC package includes the following items

CPU Card	1
IDE Cable (ATA66)	1
FDD Cable	1
Serial Port 2 Cable	1
Parallel Port Cable	1
Keyboard Cable	1
Rambus RIMM Continuity Module	2
Driver Source CD	1
Manual (User's Guide)	1
Thermal Resistor Connector	1
ATX 2.03 Power Supply cable Converter	1

If any of these items is missed or damaged, please contact your vendor for what you want

2-1 Switches

Switches on the CPU board are used to select options for different functions used. The switch-on or off is to accommodate the variations of the following table.

Switch Setting Table (: default setup)*

CPU Frequency Setting: (S2)

Frequency	S2.2	S2.3	S2.4
*100MHz	**ON**	OFF	OFF
133MHz	OFF	OFF	OFF

Serial Port 2: (S3, S4)

Mode	S4.5	S4.6	S4.7	S3.1	S3.2	S3.3	S3.4	S3.5	S3.6	S3.7	S3.8
*RS232	**ON**	OFF	OFF	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**
RS422	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF
RS485	OFF	OFF	ON	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF

U20: DiskOnChip Configuration Table: (S4)

Active Address	S4.1	S4.2	S4.3	S4.4
C000H	**ON**	OFF	OFF	OFF
C800H	OFF	**ON**	OFF	OFF
D000H	OFF	OFF	**ON**	OFF
*D800H	OFF	OFF	OFF	**ON**

RTC Clearing: (S2)

Mode	S2.5	S2.6
Clear RTC	OFF	**ON**
*Normal	**ON**	OFF

BIOS Hardware Protection: (S4.8)

Mode	S4.8
*Disable protection	**ON**
Enable Protection	OFF

Approval Panel Model List

Brand	Model	Type	Resolution	Size	Volt	Panel Switch
Sharp	LM12S40	DSTN	800X600	12.1”	5V	#4 (**Note 1)**
Sharp	LM12S49	DSTN	800X600	12.1”	3.3V	#4
Sharp	LM12S402	DSTN	800X600	12.1”	3.3V	#4
Prime View	P64CV1	TFT (18Bit)	640X480	6.4”	5V	#5/#6
Prime View	P64CV2	TFT (18Bit)	640X480	6.4”	5V	#5/#6
Sharp	LQ64D341	TFT (18Bit)	640X480	6.4”	5V	#5/#6
Sharp	LQ10D42	TFT (18Bit)	640X480	10.4”	5V	#5/#6
Samsung	121S1-105	TFT (18Bit)	800X600	12.1”	3.3V	#8/#9
Sharp	LQ12S41	TFT (18Bit)	800X600	12.1”	3.3V	#8/#9
Toshiba	LTM12C257A	TFT (18Bit)	800X600	12.1”	5V	#8/#9
Sharp	LQ12S56A	TFT (18Bit)	800X600	12.1”	3.3V	#10
Sharp	LQ14X03E	TFT (36Bit)	1024X768	13.8”	5V	#13
Sharp	LQ15X01W	TFT (36Bit)	1024X768	15”	5V	#13
Sharp	LQ15X1DG11	TFT (36Bit)	1024X768	15”	5V	#13
Samsung	LT133X1-104	LVDS (36Bit)	1024X768	13.3”	5V	#13
Samsung	LT150X1-151	TFT (36Bit)	1024X768	15”	5V	#13

Note1

Panel Switch	S1.8(MSB)	S1.7	S1.6	S1.5 (LSB)
*#4	**ON**	**ON**	OFF	OFF
#5	**ON**	OFF	**ON**	**ON**
#6	**ON**	OFF	**ON**	OFF
#8	**ON**	OFF	OFF	OFF
#9	OFF	**ON**	**ON**	**ON**
#10	OFF	**ON**	**ON**	OFF
#13	OFF	OFF	**ON**	**ON**

JP7: Panel Power Switch

Voltage	1-2	2-3
*3.3 V	Open	Short
5 V	Short	Open

2-2 Connectors

Jumper/Connector Define

Connector	Function	Remark
J1	CPU2 FAN Connector	
J2	CPU1 FAN Connector	
J3	RIMM_B2	
J4	RIMM_B1	
J6	RIMM_A2	
J7	RIMM_A1	
J8	PANEL Connector	
J10	IR Connector	
J11	Key Lock Connector	
J12	Speaker Connector	
J13	Reserved	
J14	Reset	
J15	Primary IDE Connector	
J16	Secondary IDE Connector	
J17	Floppy Connector	
J18	Parallel Connector	
J19	Serial Port #2	
J20	USB Connector	
J21	CRT Connector	
J22	PS/2 Mouse Connector	
J23	Serial Port #1	
J24	PS/2 Keyboard Connector	
JP2	HD LED	
JP3	SMBUS Connector	
JP4	System Thermal Connector	
JP5	Disk On Module Power Connector	
JP6	Keyboard Connector	
JP7	PANEL Power Switch	
U20	DiskOnChip	

J1/J2: CPU2 FAN Connector

Pin No.	Description
1	GND
2	+12V
3	Sense

J8: Panel Connector

Pin No.	Description	PIN No.	Description
1	Back light control	2	+12 V
3	Horizontal Sync.	4	Data enable
5	Clock	6	Vertical Sync.
7	Data0	8	Panel power (3/5V)
9	Data2	10	Data1
11	Data24	12	Data3
13	Data4	14	Data25
15	Data6	16	Data5
17	Data26	18	Data7
19	Data8	20	Panel power (3/5V)
21	Data10	22	Data27
23	Ground	24	Data9
25	Data28	26	Data11
27	Data12	28	Data29
29	Data14	30	Panel Voltage Bias Enable
31	Data30	32	Data13
33	Ground	34	Data15
35	Data16	36	Data31
37	Data18	38	Data17
39	NC	40	Ground
41	Data32	42	Data19
43	Data20	44	Data33
45	Data22	46	Data21
47	Data34	48	Data23
49	Ground	50	Data35

J10: IR Connector

Pin No.	Description
1	+5V
2	NC
3	Received Data
4	Ground
5	Transmit Data

J11: Key Lock Connector

Pin No.	Description
1	+5V
2	NC
3	Ground
4	Key Lock Signal
5	Ground

J12: Speaker Connector

Pin No.	Description
1	Low Active Signal
2	Ground
3	Ground
4	+5V

J14: Reset Connector

Pin No.	Description
1	Reset Signal
2	Ground

J15: Primary IDE Connector

Pin No.	Description	Pin No.	Description
1	Reset #	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	NC

J16: Secondary IDE Connector

Pin No.	Description	Pin No.	Description
1	Reset #	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	NC
21	DMA REQ	22	Ground
23	IOW	24	Ground
25	IOR	26	Ground
27	IOCHRDY	28	Pull Down
29	DMA ACK	30	Ground
31	Interrupt 14	32	NC
33	Disk Address 1	34	DMA66 Detect
35	Disk Address 0	36	Disk Address 2
37	HDC CS100	38	HDC CS300
39	HDD Active Led	40	Ground

J17: Floppy Connector

Pin No.	Description	Pin No.	Description
1	Ground	2	Drive Density Select 0
3	Ground	4	NC
5	Ground	6	Drive Density Select 1
7	Ground	8	Index Pulse Input
9	Ground	10	Motor On 0
11	Ground	12	Drive Select 1
13	Ground	14	Drive Select 0
15	Ground	16	Motor On 1
17	Ground	18	Step Direction
19	Ground	20	Step Pulse
21	Ground	22	Write Disk Data
23	Ground	24	Write Gate
25	Ground	26	Track 0
27	Ground	28	Write Protected
29	NC	30	Read Disk Date

31	Ground	32	Head Select
33	NC	34	Disk Change

J18: Parallel Connector

Pin No.	Description	Pin No.	Description
1	Strobe	2	Data 0
3	Data 1	4	Data 2
5	Data 3	6	Data 4
7	Data 5	8	Data 6
9	Data 7	10	Acknowledge
11	Busy	12	Paper Empty
13	Printer Select	14	Auto Form Feed#
15	Error#	16	Initialize
17	Printer Select IN	18	Ground
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	NC

J19: Serial Port # 2

Pin No.	Description
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground
6	Data Set Ready (DSR)
7	Request To Send (RTS)
8	Clear To Send (CTS)
9	Ring Indicator (RI)
10	Ground

J19: Optional to RS422/485

Pin No.	Description
1	Transmit Data Positive
2	Transmit Data Negative
3	Receive Data Negative (RS-422)
4	Receive Data Positive (RS-422)

J20: USB Connector

Pin No.	Description
1	+5V
2	Data 0 Negative
3	Data 0 Positive
4	Data 1 Negative
5	Data 1 Positive
6	Ground

J21: CRT Connector

Pin No.	Description	PIN No.	Description
1	Red	2	Green
3	Blue	4	+5V Pull-High
5	Analog Ground	6	Analog Ground
7	Analog Ground	8	Analog Ground
9	+5V	10	Analog Ground
11	NC	12	DDC Data
13	Horizontal Sync.	14	Vertical Sync.
15	DDC Clock		

J22: PS/2 Mouse Connector

Pin No.	Description
1	Data
2	NC
3	Ground
4	+5V
5	Clock
6	NC

J23: Serial Port # 1

Pin No.	Description
1	Data Carrier Detect (DCD)
2	Receive Data (RXD)
3	Transmit Data (TXD)
4	Data Terminal Ready (DTR)
5	Ground
6	Data Set Ready (DSR)
7	Request To Send (RTS)
8	Clear To Send (CTS)
9	Ring Indicator (RI)

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J24: PS/2 Keyboard Connector

Pin No.	Description
1	Data
2	NC
3	Ground
4	+5V
5	Clock
6	NC

JP2: HD LED

Pin No.	Description
1	+5V
2	Low Active Signal

JP3: SMBUS Connector

Pin No.	Description
1	SMBUS Data
2	SMBUS Clock

JP4: System Thermal Connector

Pin No.	Description
1	Input
2	Input

JP5: Disk On Module Power Connector

Pin No.	Description
1	+5V
2	Ground
3	Ground
4	+5V

JP6: Keyboard Connector

Pin No.	Description
1	Clock
2	Data
3	NC
4	Ground
5	+5V

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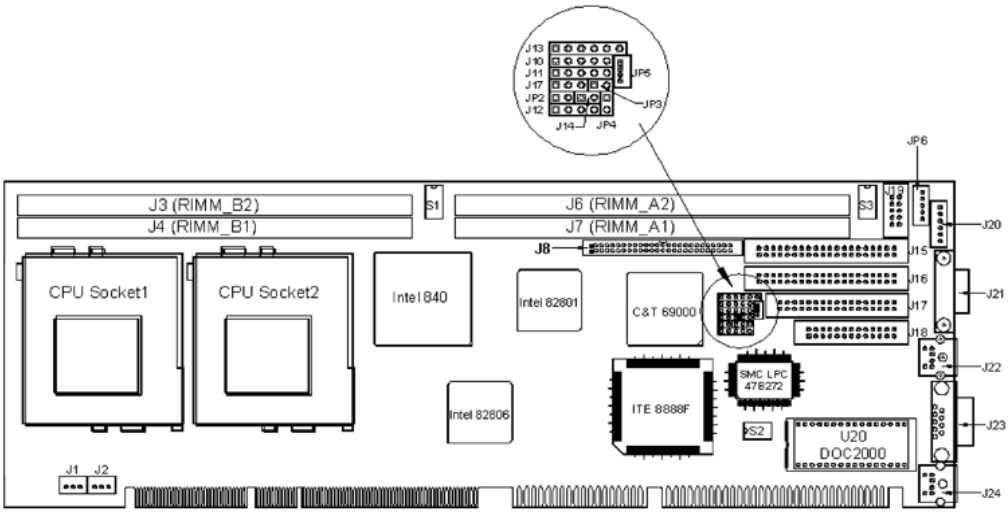
Chapter 2

Switches and Connectors

This chapter gives the definitions and shows where to locate the positions of switches and connectors.



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Chapter 3

AWARD BIOS Setup

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM (CMOS RAM) so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press <Del> immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press <Del> key or simultaneously press <Ctrl>, <Alt>, and <Esc> keys.

> TO ENTER SETUP BEFORE BOOT PRESS <CTRL-ALT-ESC> OR <DEL> KEY

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to,

> PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

Control Keys

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp / "+" key	Increase the numeric value or make changes
PgDn / "–" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift)F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default , only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <F1> or <Esc>.

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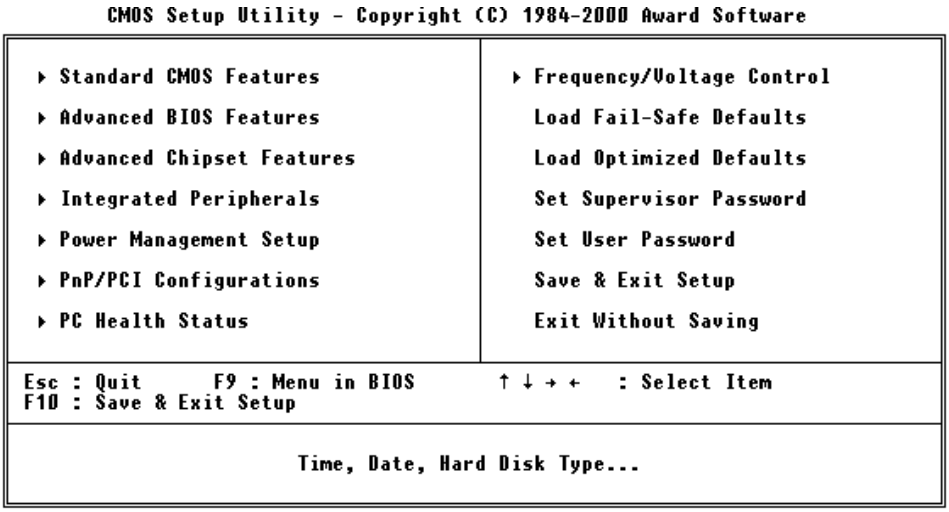
The Main Menu

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
Standard CMOS Features
Advanced BIOS Features
Advanced Chipset Features
Integrated Peripherals
Power Management Setup
PnP/PCI Configurations
PC Health Status
Frequency/Voltage Control
Load Fail-Safe Defaults
Load Optimized Defaults
Set Supervisor Password
Set User Password
Save & Exit Setup
Exit Without Saving
Esc : Quit F9 : Menu in BIOS ↑ ↓ → ← : Select Item
F10 : Save & Exit Setup
Time, Date, Hard Disk Type...

Standard CMOS setup

This setup page includes all the items in a standard compatible BIOS. See Page 4-7 to Page 4-10 for details.

BIOS features setup

This setup page includes all the items of Award special enhanced features. See Page 4-11 to Page 4-15 for details.

Chipset features setup

This setup page includes all the items of chipset special features. See Page 4-16 to Page 4-20 for details.

Power Management setup

This category determines how much power consumption for system after selecting below items. Default value is Disable. See Page 4-21 to Page 4-25 for details.

PNP/PCI Configuration

This category specifies the assignment of all the IRQ's and DMA's.
See Page 4-26 to Page 4-27 for details.

Load BIOS defaults

BIOS defaults indicates the most appropriate value of the system parameter which the system would be in minimum performance. The OEM manufacturer may change the defaults through MODBIN before the binary image burn into the ROM.

Load Setup defaults

Chipset defaults indicates the values required by the system for the maximum performance. The OEM manufacturer may change to defaults through MODBIN before the binary image burn into the ROM.

Integrated Peripherals System Environment

This category allows you to set up all the on board I/O controllers like IDE, SCSI, FDC, etc,. See Page 4-28 to Page 4-30

Password Setting

Change, set, or disable password of supervisor or user. It allows you to limit access to the system and Setup, or just to Setup. See Page 4-31 for details.

IDE HDD auto detection

Automatically configure hard disk parameters. See Page 4-32 to Page 4-35.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit without saving

Abandon all CMOS value changes and exit setup.

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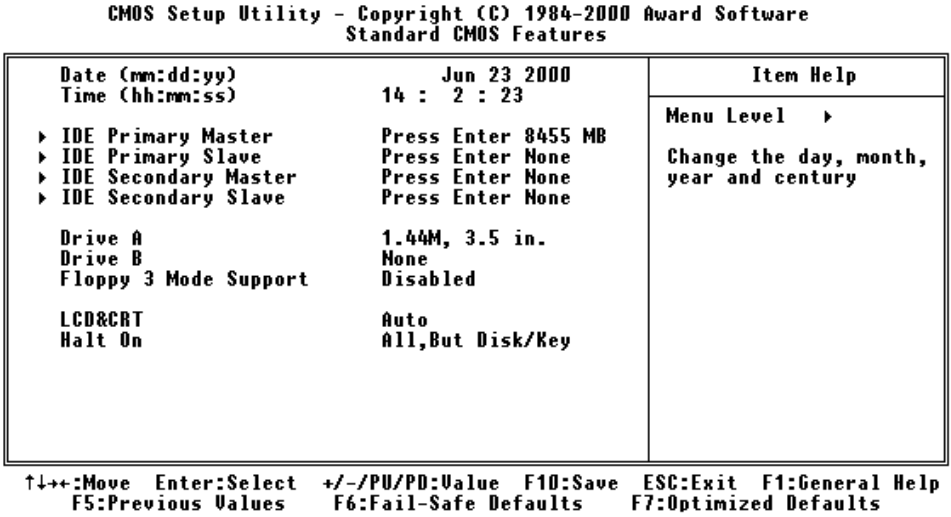
Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
Standard CMOS Features
Date (mm:dd:yy) Jun 23 2000
Time (hh:mm:ss) 14 : 2 : 23
IDE Primary Master Press Enter 8455 MB
IDE Primary Slave Press Enter None
IDE Secondary Master Press Enter None
IDE Secondary Slave Press Enter None
Drive A 1.44M, 3.5 in.
Drive B None
Floppy 3 Mode Support Disabled
LCD&CRT Auto
Halt On All,But Disk/Key
Item Help
Menu Level ▸
Change the day, month, year and century
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Date

The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

Day	The day of week, from Sun to Sat, determined by the BIOS, is read only
date	The date, from 1 to 31 (or the maximum allowed in the month), can key in the numerical / function key
month	The month, Jan through Dec
year	The year, depend on the year of BIOS

Time

The time format is <hour> <minute> <second>. which accepts both function key or numerical key The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

Primary Master/Primary Slave

The categories identify the types of drives that have been installed in the computer. There are 45 predefined types and 2 user definable types are for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type User is user-definable.

Press PgUp/<+> or PgDn/<–> to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be "Type 1".
If the controller of HDD interface is SCSI, the selection shall be "None".
If the controller of HDD interface is CD-ROM, the selection shall be "None".

CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precom
LANDZONE	landing zone
SECTORS	number of sectors
MODE	HDD access mode

If a hard disk has not been installed select NONE and press <Enter>.

Drive A type/Drive B type

The category identifies the types of floppy disk drive A or drive B that have been installed in the computer.

None	No floppy drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

Video

The category selects the type of adapter used for the primary system monitor that must match your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in Setup.

You have two ways to boot up the system:
1. When VGA as primary and monochrome as secondary, the selection of the
video tape is "VGA Mode".
2. When monochrome as primary and VGA as secondary, the selection of the
video type is "Monochrome Mode".

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

Error Halt

The category determines whether the computer will stop if an error is detected during power up.

No errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted.
All errors	The system boot will not be stopped for any error that may be detected.
All,But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

Memory

The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

Base Memory

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.

Extended Memory

The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

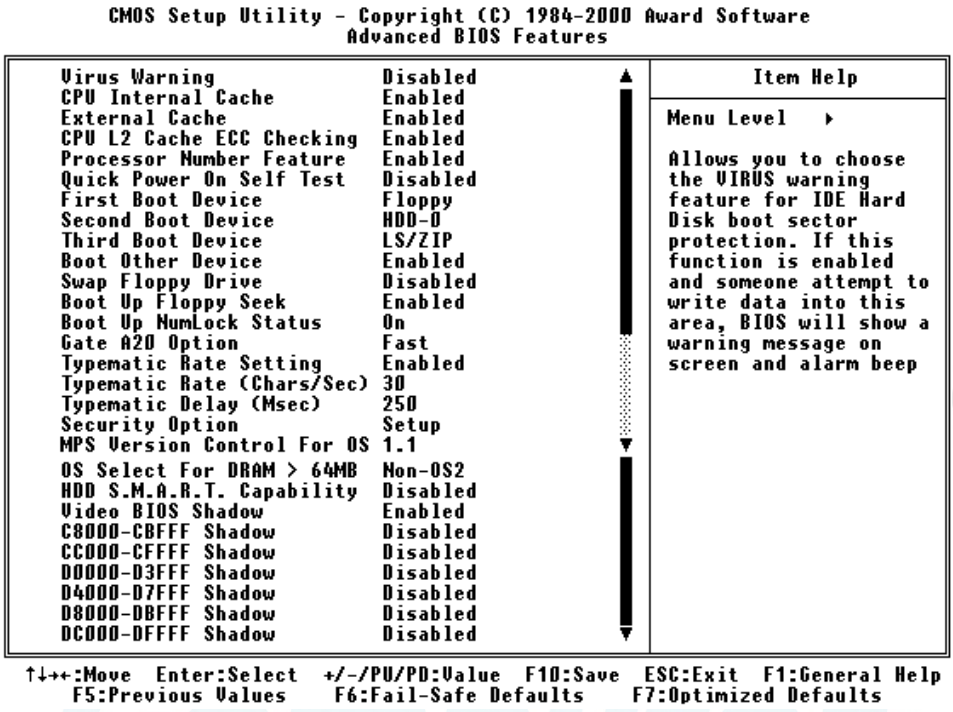
Other Memory

This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use for this area is Shadow RAM.

Total Memory

System total memory is the sum of basic memory, extended memory, and other memory.

BIOS Features Setup Menu


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
Advanced BIOS Features
Virus Warning Disabled
CPU Internal Cache Enabled
External Cache Enabled
CPU L2 Cache ECC Checking Enabled
Processor Number Feature Enabled
Quick Power On Self Test Disabled
First Boot Device Floppy
Second Boot Device HDD-0
Third Boot Device LS/ZIP
Boot Other Device Enabled
Swap Floppy Drive Disabled
Boot Up Floppy Seek Enabled
Boot Up NumLock Status On
Gate A20 Option Fast
Typematic Rate Setting Enabled
Typematic Rate (Chars/Sec) 30
Typematic Delay (Msec) 250
Security Option Setup
MPS Version Control For OS 1.1
OS Select For DRAM > 64MB Non-OS2
HDD S.M.A.R.T. Capability Disabled
Video BIOS Shadow Enabled
C8000-CBFFF Shadow Disabled
CC000-CFFFF Shadow Disabled
D0000-D3FFF Shadow Disabled
D4000-D7FFF Shadow Disabled
D8000-DBFFF Shadow Disabled
DC000-DFFFF Shadow Disabled
Item Help
Menu Level ▸
Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Virus Warning

This category flashes on the screen. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and the following error message will appear, in the mean time, you can run an anti-virus program to locate the problem.

! WARNING !
Disk boot sector is to be modified
Type "Y" to accept write or "N" to abort write
Award Software, Inc.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Note: This function is available only for DOS and other OSes that do not trap INT13.

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is Enable. If your CPU without Internal Cache then this item "CPU Internal Cache" will not be show.

Enabled	Enable cache
Disabled	Disable cache

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

Enabled	Enable quick POST
Disabled	Normal POST

Boot Sequence

This category determines which drive computer searches first for the disk operating system (i.e., DOS). Default value is A,C.

C,A	System will first search for hard disk drive then floppy disk drive.
A,C	System will first search for floppy disk drive then hard disk drive.

Note: This function is only available for IDE type
For SCSI type is always boot from A.

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K.

Boot Up NumLock Status

The default value is On.

On	Keypad is number keys
Off	Keypad is arrow keys

Typematic Rate Setting

This determines the typematic rate.

Enabled	Enable typematic rate and typematic delay programming
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of this 2 items and the default is controlled by keyboard.

Typematic Rate (Chars/Sec)

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

Typematic Delay (Msec)

When holding a key, the time between the first and second character displayed.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

Security Option

This category allows you to limit access to the system and Setup, or just to Setup.

System	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

PCI/VGA Palette Snoop

It determines whether the MPEG ISA/VESA VGA Cards can work with PCI/VGA or not.

Enabled	When PCI/VGA working with MPEG ISA/VESA VGA Card.
Disabled	When PCI/VGA not working with MPEG ISA/VESA VGA Card.

OS Select for DRAM > 64MB

This segment is specifically created for OS/2 when DRAM is larger than 64MB. If your operating system is OS/2 and DRAM used is larger the 64MB, you have to select "OS 2", otherwise, non-OS2, default is NON-OS2.

Video BIOS Shadow

It determines whether video BIOS will be copied to RAM, however, it is optional from chipset design. Video Shadow will increase the video speed.

Enabled	Video shadow is enabled
Disabled	Video shadow is disabled

C8000 - CFFFF Shadow/D8000 - DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per/unit and the size depends on chipset.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

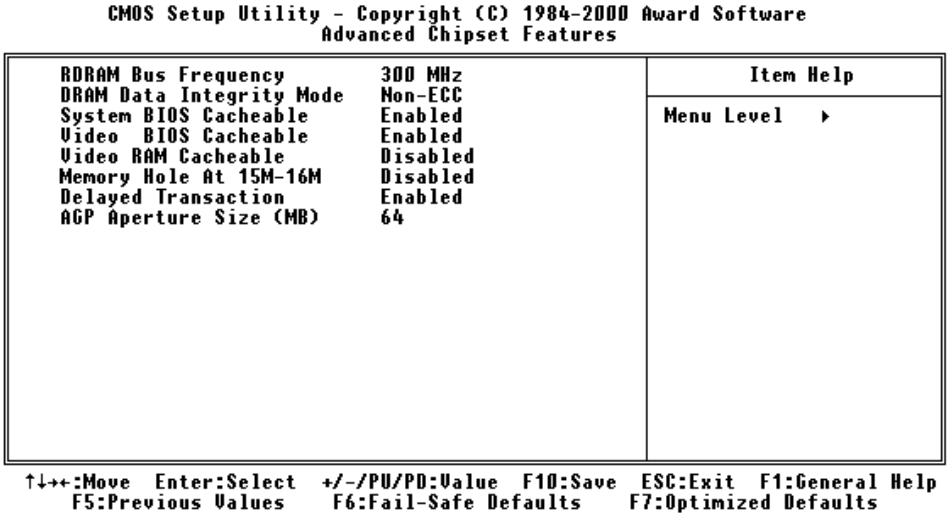
Note:
1. for C8000-DFFFF option-ROM on PCI BIOS , BIOS will automatically enable the shadow RAM. User does not have to select the item.

2. IDE second channel control:
Enable: enable secondary IDE port and BIOS will assign IRQ15 for this port.
Disable: disable secondary IDE port and IRQ15 is available for other device. The item is optional only for PCI BIOS.

3. Some of the sound cards have an onboard CD-ROM controller which uses IDE Secondary Port. In order to avoid PCI IDE conflict,
4. the IDE secondary channel control has to select "disable" then CD-ROM can work.

Advanced Chipset Features Setup Menu

Since the features in this section are related to the chipset in the CPU board and all are optimized, you are not recommended to change the default settings in the setup table, unless you know very detailed of the chipset features.


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
Advanced Chipset Features
RDRAM Bus Frequency 300 MHz
DRAM Data Integrity Mode Non-ECC
System BIOS Cacheable Enabled
Video BIOS Cacheable Enabled
Video RAM Cacheable Disabled
Memory Hole At 15M-16M Disabled
Delayed Transaction Enabled
AGP Aperture Size (MB) 64
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

RDRAM Bus Frequency

This item defines the RDRAM bus frequency.
The Choice: 400MHz, 356MHz, 300MHz, 266MHz.

SDRAM CAS Latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.
The Choice: 2, 3

RDRAM Device Napdown

Select *Disabled* to increase 5% system performance or select *Enabled* to enter the RDRAM device power save mode.
The Choice: Enabled, Disabled.

RDRAM Data Integrity Mode

Select Parity or ECC (error-correcting code), according to the type of installed DRAM.
The Choice: Non-ECC, ECC..

System BIOS Cacheable

Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The choice: Enabled, Disabled.

Video BIOS Cacheable

Select Enabled allows caching of the video BIOS , resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The Choice: Enabled, Disabled.

Video RAM Cacheable

Select Enabled allows caching of the video RAM , resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The Choice: Enabled, Disabled.

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

The Choice: Enabled, Disabled.

Delay Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1.

The Choice: Enabled, Disabled.

AGP Fast Write

This item will enable the AGP model into fast write mode.

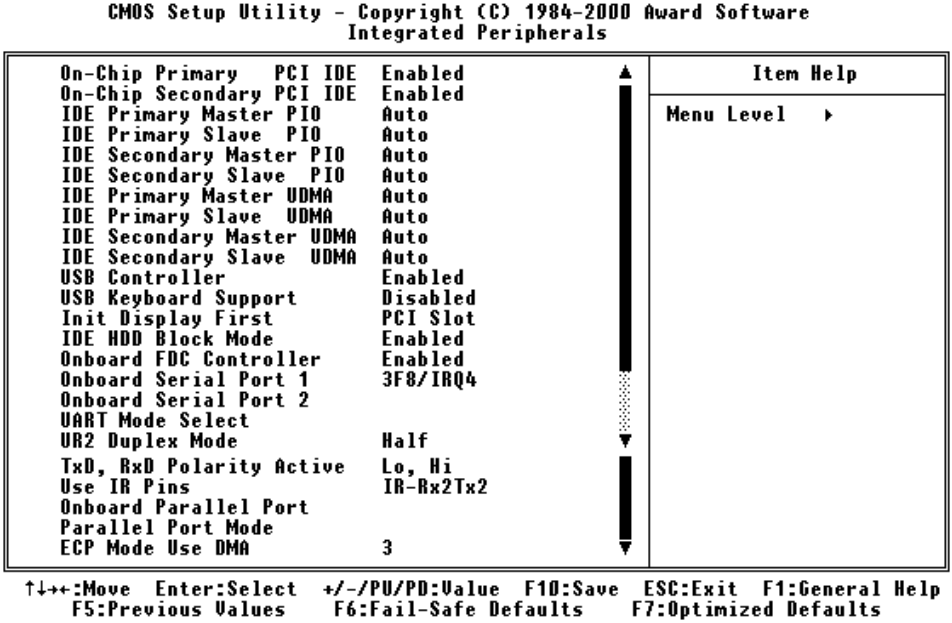
The Choice: Enabled, Disabled.

AGP Aperture Size (MB)

Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. See www.agpforum.org for AGP information.

The choice: 4, 8, 16, 32, 64, 128, 256

Integrated Peripherals


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
Integrated Peripherals
On-Chip Primary PCI IDE Enabled
On-Chip Secondary PCI IDE Enabled
IDE Primary Master PIO Auto
IDE Primary Slave PIO Auto
IDE Secondary Master PIO Auto
IDE Secondary Slave PIO Auto
IDE Primary Master UDMA Auto
IDE Primary Slave UDMA Auto
IDE Secondary Master UDMA Auto
IDE Secondary Slave UDMA Auto
USB Controller Enabled
USB Keyboard Support Disabled
Init Display First PCI Slot
IDE HDD Block Mode Enabled
Onboard FDC Controller Enabled
Onboard Serial Port 1 3F8/IRQ4
Onboard Serial Port 2
UART Mode Select
UR2 Duplex Mode Half
TxD, RxD Polarity Active Lo, Hi
Use IR Pins IR-Rx2Tx2
Onboard Parallel Port
Parallel Port Mode
ECP Mode Use DMA 3
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

IDE Primary/Secondary Master/Slave UDMA

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

The choice: Enabled, Disabled.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

IDE Primary/Secondary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.

The Choice: Auto, Disabled.

USB Controller

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

The choice: Enabled, Disabled.

USB Keyboard Support

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

The choice: Enabled, Disabled.

Init Display First

This item allows you to decide to active whether PCI Slot or on-chip VGA first

The choice: PCI Slot, Onboard.

AC97 Audio/Modem

This item allows you to decide to enable/disable the 810 chipset family to support AC97 Audio/Modem.

The choice: Enabled, Disabled.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

The choice: Enabled, Disabled

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field.

The choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

UART Mode Select

This item allows you to select UART mode.

The choice: Enabled, Disabled.

RxD, TxD Active

This item allows you to determine the active of RxD, TxD.

The Choice: "Hi, Hi", "Lo, Lo", "Lo, Hi", "Hi, Lo".

IR Transmission delay

This item allows you to enable/disable IR transmission delay.

The choice: Enabled, Disabled.

UR2 Duplex Mode

This item allows you to select the IR half/full duplex funcion.

The choice: Half, Full.

Use IR Pins

This item allows you to select IR transmission routes, one is RxD2m, TxD2 (COM Port) and the other is IR-Rx2Tx2.

The choice: IR-Rx2Tx2, RxD2,TxD2.

Onboard Parallel Port

This item allows you to determine access onboard parallel port controller with which I/O address.

The choice: 3BC/IRQ7, 378/IRQ7, 278/IRQ5, Disabled.

Parallel Port Mode

Select an operating mode for the onboard parallel (printer) port. Select *Normal, Compatible,* or *SPP* unless you are certain your hardware and software both support one of the other available modes.

The choice: SPP, EPP, ECP, ECP+EPP.

EPP Mode Select

Select EPP port type 1.7 or 1.9.

The choice: EPP1.7, 1.9.

ECP Mode Use DMA

Select a DMA channel for the parallel port for use during ECP mode.

The choice: 3, 1.

This item allows you to select the Game Port Address.

The choice: Disabled, 201, 209.

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Computer

Midi Port Address

This item allows you to select the Midi Port Address.

The choice: Disabled, 330, 300

Midi Port IRQ

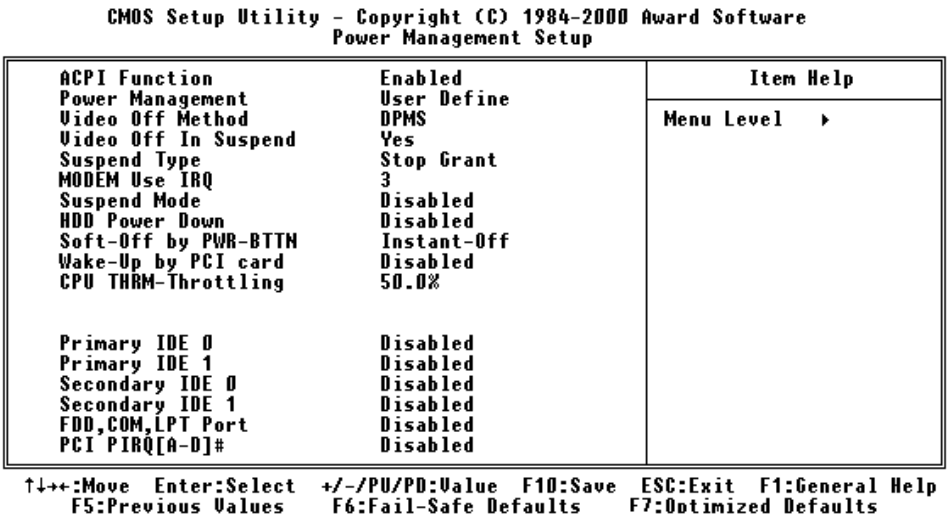
This item allows you to select the Midi Port IRQ.

The choice: 5, 10.

DSM® Computer

Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
Power Management Setup
ACPI Function Enabled
Power Management User Define
Video Off Method DPMS
Video Off In Suspend Yes
Suspend Type Stop Grant
MODEM Use IRQ 3
Suspend Mode Disabled
HDD Power Down Disabled
Soft-Off by PWR-BTTN Instant-Off
Wake-Up by PCI card Disabled
CPU THRM-Throttling 50.0%
Primary IDE 0 Disabled
Primary IDE 1 Disabled
Secondary IDE 0 Disabled
Secondary IDE 1 Disabled
FDD,COM,LPT Port Disabled
PCI PIRQ[A-D]# Disabled
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

AGP Aperture Size (MB)

This item will allow you to select the ACPI suspend type. You can select S3 (STR) for suspending to DRAM or S1 (POS) for power on suspend under Windows 98 ACPI mode.

The choice: S1(POS), S3(STR).

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. HDD Power Down
2. Doze Mode
3. Suspend Mode

There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU's**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This determines the manner in which the monitor is blanked.

The choice: Yes, No.

Suspend Type

Select the Suspend Type.

The choice: PWRON Suspend, Stop Grant.

MODEM Use IRQ

This determines the IRQ in which the MODEM can use.

The choice: 3, 4, 5, 7, 9, 10, 11, NA.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

The choice: Enabled, Disabled.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

The choice: Enabled, Disabled.

Soft-Off by

PWR-BTTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung."

The choice: Delay 4 Sec, Instant-Off.

PowerOn by Ring

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

The choice: Enabled, Disabled.

USB KB Wake-Up From S3

This item will enable you to wake-up the system by USB keyboard when you shut down the computer in S3 mode.

The choice: Enabled, Disabled.

CPU THRM-Throttling

Select the CPU THRM-Throttling rate.

The choice: 25.0%, 37.5%, 50.0%, 62.5%, 75.0%, 87.5%.

PM Events

PM events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as *Enabled* , even when the system is in a power down mode.

Primary IDE 0

Primary IDE 1

Secondary IDE 0

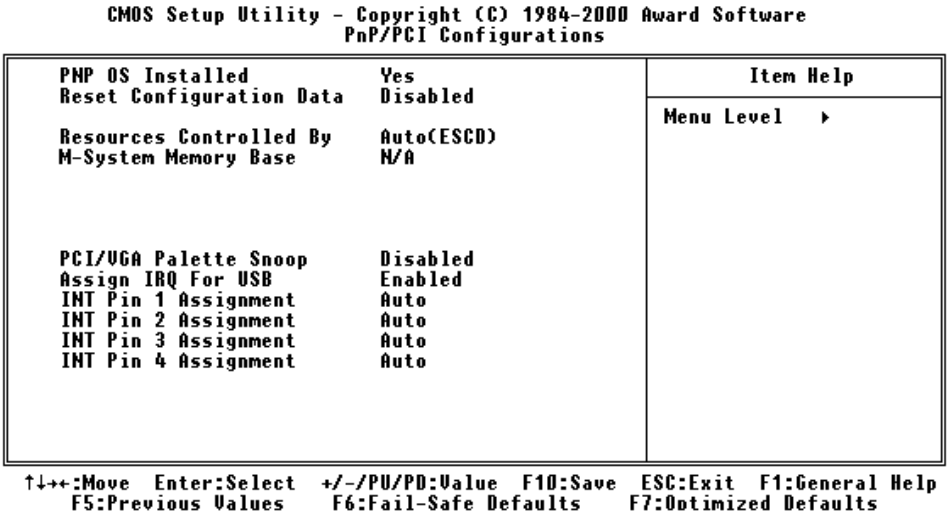
Secondary IDE 1

FDD, COM, LPT Port

PCI PIRQ[A-D] #

PnP/PCI Configuration

This section describes configuring the PCI bus system. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
PnP/PCI Configurations
PNP OS Installed Yes
Reset Configuration Data Disabled
Resources Controlled By Auto(ESCD)
M-System Memory Base N/A
PCI/VGA Palette Snoop Disabled
Assign IRQ For USB Enabled
INT Pin 1 Assignment Auto
INT Pin 2 Assignment Auto
INT Pin 3 Assignment Auto
INT Pin 4 Assignment Auto
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot.

The choice: Enabled, Disabled .

Resource controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➢").

The choice: Auto(ESCD), Manual.

IRQ Resources

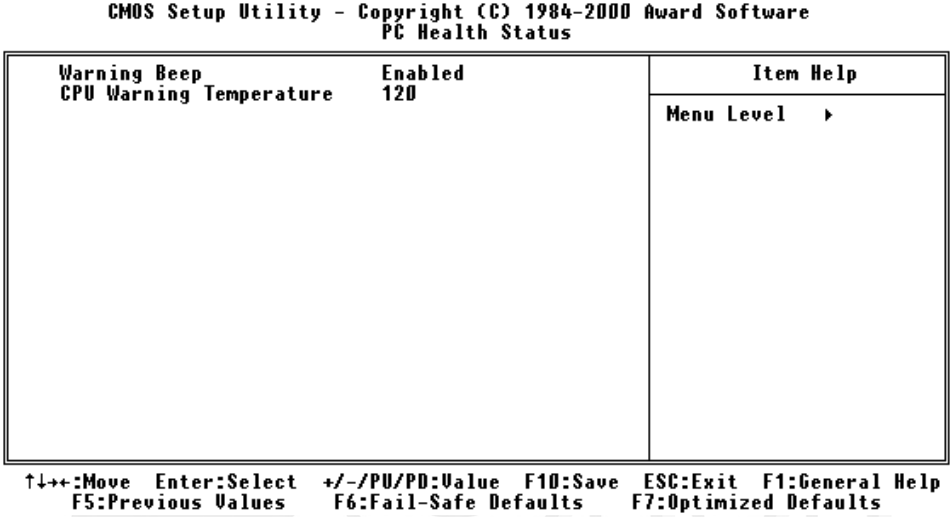
When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

PCI/VGA Palette Snoop

Leave this field at *Disabled*.

The choice: Enabled, Disabled.

PC Health Status


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
PC Health Status
Warning Beep Enabled
CPU Warning Temperature 120
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

PCI/VGA Palette Snoop

This item will prevent CPU from overheating.

The choice: 30-120.

Current System Temp.

Show you the current system temperature.

Current CPU1 Temperature

Show you the current CPU1 temperature.

Current CPUFAN 1/2/3 Speed

Show you the current CPUFAN operating speed.

IN0/1/2 (V)

Show you the voltage of Vin (0)/(1)/(2).

+5V/+12V/-12V/-5V

Show you the voltage of +5V/+12V/-12V/-5V.

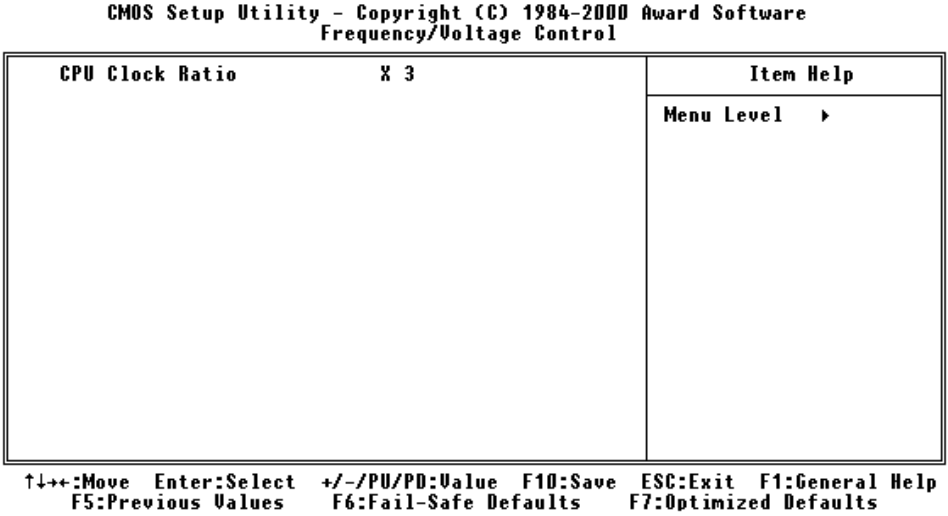
PCI/VGA Palette Snoop

This item allows you to set up the CPU shutdown Temperature. This item only effective under Windows 98 ACPI mode.

The Choice: Disabled, 60°C/140°F, 65°C/149°F, 70°C/159°F, 75°C/167°F.

DSM® Computer

Frequency/Voltage Control


CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
Frequency/Voltage Control
CPU Clock Ratio
X 3
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F6:Fail-Safe Defaults F7:Optimized Defaults

PCI/VGA Palette Snoop

This item allows you to set up the CPU clock ratio, but this function depends on different CPU performance. It is only effective for those clock ratio haven't been locked.

The choice: X3.0~X8.0.

Supervisor/User Password Setting

You can set either supervisor or user password, or both of then. The differences between are:

supervisor password : can enter and change the options of the setup menus.
user password : just can enter but do not have the right to change the options of the setup menus.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 4). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

IDE HDD Auto Detection

The Enhance IDE features was included in all Award BIOS. Below is a brief description of this feature.

1. Setup Changes

<I> Auto-detection

BIOS setup will display all possible modes that supported by the HDD including NORMAL, LBA & LARGE.

if HDD does not support LBA modes, no 'LBA'option will be shown.

Users can select a mode which is appropriate for them.

ROM/PCI/ISA BOPS (2XXXXXXX)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISKS TYPE SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE
Primary Master :

Select Primary Master Option (N = Skip) : N

OPTION	SIZE	CYLS	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
1(Y)		516	1120	16	65535		1119
		59	NORMAL				
2		516	524	32	0	1119	
		63	LBA				

<II> Standard CMOS Setup

		CYLS	Heads	Precomp	Landzone	Sector	Mode
Primary Master:	User (516MB)	1120	16	65535	1119	59	Normal
Primary Slave:	None (203MB)	684	16	65535	685	38	------

Secondary Master:	None	0	0	0	0	0	0
Secondary Slave	None	0	0	0	0	0	0

When HDD type is in 'user' type, the "MODE" option will be opened for user to select their own HDD mode.

(2) HDD Modes

The Award BIOS supports 3 HDD modes : NORMAL, LBA & LARGE

NORMAL mode

Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders, head & sectors for NORMAL mode are 1024, 16 & 63.

no. Cyclinder	(1024)
x no. Head	(16)
x no. Sector	(63)
x no. per sector	(512)
	528 Megabytes

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that!

LBA (Logical Block Addressing) mode

A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD.

During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder number into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4 Gigabytes which is obtained by the following formula:

no. Cyclinder	(1024)
x no. Head	(255)
x no. Sector	(63)
x bytes per sector	(512)
	8.4 Gigabytes

LARGE mode

Extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The Award BIOS provides another alternative to support these kinds of HDD!
Example of LARGE mode:

	CYLS.	HEADS	
SECTOR	MODE		
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT13h in order to access the right HDD address the right HDD address!

Maximum HDD size:

no. Cyclinder	(1024)
x no. Head	(32)
x no. Sector	(63)
x bytes per sector	(512)
	1 Gigabytes

(3) Remarks

To support LBA or LARGE mode of HDDs, there must be some softwares involved. All these softwares are located in the Award HDD Service Routine(INT 13h). It may be failed to access a HDD with LBA (LARGE) mode selected if you are running under a Operating System which replaces the whole INT 13h.

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Power-On Boot

After you have made all the changes to CMOS values and the system cannot boot with the CMOS values selected in Setup, restart the system by turning it OFF then ON or Pressing the "RESET" button on the system case. You may also restart by simultaneously press <Ctrl>, <Alt>, and <Delete> keys.
Upon restart the system, immediately press <Insert> to load BIOS default CMOS value for boot up.

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BIOS Reference - POST Message

During the Power On Self Test (POST), if the BIOS detects an error requiring you to do something to fix, it will either sound a beep code or display a message.
If a message is displayed, it will be accompanied by:
PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

POST Beep

Currently there is only one beep code in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes messages for both the ISA and the EISA BIOS.

CMOS BATTERY HAS FAILED

CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER

No boot device was found. This could mean that either a boot drive was not detected or the drive does not contain proper system boot files. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from the hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

DISPLAY SWITCH IS SET INCORRECTLY

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

DISPLAY TYPE HAS CHANGED SINCE LAST BOOT

Since last powering off the system, the display adapter has been changed. You must configure the system for the new display type.

EISA Configuration Checksum Error
PLEASE RUN EISA CONFIGURATION UTILITY

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has been configured incorrectly. Also be sure the card is installed firmly in the slot.

EISA Configuration Is Not Complete
PLEASE RUN EISA CONFIGURATION UTILITY

The slot configuration information stored in the EISA non-volatile memory is incomplete.

> Note: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

ERROR ENCOUNTERED INITIALIZING HARD DRIVE

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DISK CONTROLLER

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT

Cannot find or initialize the floppy drive controller. make sure the controller is installed correctly and firmly. If there are no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA Configuration
PLEASE RUN EISA CONFIGURATION UTILITY

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

KEYBOARD ERROR OR NO KEYBOARD PRESENT

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.
If you are purposely configurating the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

Memory Address Error at ...

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory parity Error at ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

MEMORY SIZE HAS CHANGED SINCE LAST BOOT

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

Memory Verify Error at ...

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

OFFENDING ADDRESS NOT FOUND

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

PRESS A KEY TO REBOOT

This will be displayed at the bottom screen when an error occurs that requires you to reboot. Press any key and the system will reboot.

PRESS F1 TO DISABLE NMI, F2 TO REBOOT

When BIOS detects a Non-maskable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT ...

Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found
PLEASE RUN EISA CONFIGURATION UTILITY

A valid board ID was found in a slot that was configurated as having no board ID.

> NOTE; When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Should Have EISA Board But Not Found
PLEASE RUN EISA CONFIGURATION UTILITY

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

> NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

Slot Not Empty

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

> NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Wrong Board In Slot
PLEASE RUN EISA CONFIGURATION UTILITY

The board ID does not match the ID stored in the EISA non-volatile memory.
NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.

BIOS Reference - POST Codes

POST (hex)	Description
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
0h1	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved
03h	Initial Superio_Early_Init switch.
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able

POST (hex)	Description
	or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686).
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable

POST (hex)	Description
	respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization: -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device & VGA BIOS, and put it into C000:0.
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	1. Initialize multi-language 2. Put information on screen display, including Award title, CPU type, CPU speed ….
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved
3Ch	Test 8254
3Dh	Reserved

POST (hex)	Description
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved
42h	Reserved
43h	Test 8259 functionality.
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program write allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD

POST (hex)	Description
	(optional)
5Ch	Reserved
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onbaord_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup & Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO".
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware.
70h	Reserved
71h	Reserved
72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP, CDROM…..
76h	Reserved

POST (hex)	Description
77h	Detect serial ports & parallel ports.
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆Clear EPA or customization logo.
80h	Reserved
81h	Reserved
E8POST.ASM starts	
82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS
84h	Initialize ISA PnP boot devices
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs.
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache

POST (hex)	Description
	2. Program boot up speed 3. Chipset final initialization. 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7. Program P6 class write combining
95h	1. Program daylight saving 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table.
FFh	Boot attempt (INT 19h)

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Appendix

Memory Mapping